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# *Forum of Innovation*

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*Friday evening & June 19, 1998*



6:00 Welcome by Dr. Arthur Molella  
Director, Lemelson Center

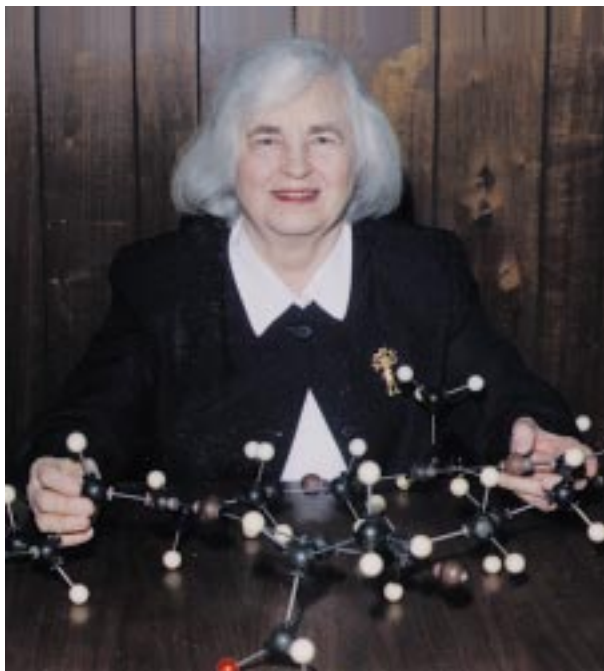
6:10 Dr. Alan Berman  
NRL Director of Research 1967–1982

6:20 Dr. F.E. Saalfeld  
Executive Director and Technical Director,  
Office of Naval Research

6:30 Presentation of Lifetime Achievement Awards and Awards for Innovation  
CAPT Bruce Buckley, NRL Commanding Officer  
Dr. Timothy Coffey, NRL Director of Research

7:30 Concluding Remarks  
Dr. Timothy Coffey

*Reception immediately following  
Palm Court  
National Museum of American History*



## NRL Lifetime Achievement Award

### *Dr. Isabella L. Karle*

During her 52 years of service at the Naval Research Laboratory (NRL), Dr. Isabella Karle's work has led to major advances in chemistry and the chemical industry. Dr. Karle is responsible for the development and extensive application of a method for determining essentially equal-atom crystal and molecular structures by X-ray analysis. The method transformed analyses that were characterized by tedious frustration and abortive efforts to one of systematic processes. From a small number of structure analyses being published in the 1960s, her procedure has led to the analyses and publication of many thousands of structures of complicated molecules annually. All of the present computerized programs for X-ray

structure analyses are based on her fundamental work known as the Symbolic Addition Procedure. Its high success rate has had a profound effect on the practice of organic and biological chemistry.

The types and complexity of problems which may be readily attacked in crystal structure analysis and the methodology for effecting this have been revolutionized by her work. Many applications are now being made that involve structure determination for the ready identification of known or unknown natural products, reaction intermediates, photorearrangement products undergoing vast changes from the original material, and final products of synthetic or reaction processes. Such information provides the basis for theoretical chemistry programs and computer-assisted drug design used by most pharmaceutical firms.

Dr. Karle has not only developed the widely used method for structure determination from X-ray diffraction, she has also identified and determined the structures of a number of complex substances of considerable chemical and biomedical significance and has personally taught the new analytical techniques to a large number of workers in the field. Among the numerous substances that she has investigated are nucleic acid bases, heart drugs, antibiotics, narcotic antagonists, and cyclic polypeptides which can act as ion carriers in biological systems. She has established the nature of the severe conformational changes that occur in peptides upon complexation with metal ions and has made precise determination of the parameters of an infinite beta-sheet.

Dr. Karle occupies a position of leadership and high productivity in a field which provides the necessary conceptual contexts in which numerous other fields of science can progress. Her investigations represent pioneering studies in establishing the structural formulae and conformations of many classes of compounds. It was only after her demonstration of the capabilities and ease of application of the Symbolic Addition Procedure that widespread use was made of the method for direct structure analysis. Dr. Karle deserves the highest recognition for her many outstanding achievements.



## NRL Lifetime Achievement Award

### *Mr. Peter G. Wilhelm*

During his 39 years of service at the Naval Research Laboratory (NRL), Mr. Peter G. Wilhelm has contributed to and led the design, development, and deployment of 87 scientific and defense satellites, significantly advancing the state-of-the-art in U.S. satellite technology. This has earned him the reputation as one of the nation's pioneers and foremost experts in space systems engineering. Mr. Wilhelm is credited with primary responsibility for 48 satellites, making him one of the most experienced space systems engineers in the world today.

His service at NRL has been marked by continuously increasing responsibility and highly visible advances to the state-of-the-art in satellite technology. In these assignments he has consistently

demonstrated not only his own ability to develop an ever-widening variety of satellite systems, but also his superlative ability to lead a team of extremely competent engineers and scientists. His vision and leadership led to the establishment of an organization for space engineering excellence, the Naval Center for Space Technology (NCST), which has provided the nation with unique and timely solutions to both national and DoD technology needs.

Mr. Wilhelm pioneered the Multiple Satellite Dispenser (MSD) concept. The MSD served as the upper stage launch vehicle to carry multiple satellites into orbit using refurbished, rather than new, Atlas intercontinental ballistic missiles. The savings to the nation easily amount to millions of dollars relative to the cost of using new boosters or other launch vehicles. Based on the success of the MSD concept, NRL was commissioned to design, develop, and fabricate the Shuttle Launch Dispenser, which was modified into the Titan Launch Dispenser (TLD) following the Challenger tragedy. The TLD subsequently delivered several "heavy weight" national missions to their final orbits. Based on the success of TLD, NCST was cited by President Ronald Reagan for its significant contribution to maintaining national capabilities.

Also, most noteworthy were his roles in the Deep Space Program Science Experiment (Clementine) mission performed for the Ballistic Missile Defense Organization, the Tether Physics and Survivability Experiment (TiPS) performed for the National Reconnaissance Office, the Low-power Atmospheric Compensation Experiment (LACE) satellite built for the Strategic Defense Initiative Organization, the Living Plume Shield (LIPS) satellites, the TIMATION/NAVSTAR GPS satellites, and the Solar Radiation (SOLRAD) satellite program.

Under Mr. Wilhelm's leadership, the NCST is the standard to which private industry is held. Sponsors of space-related work in the Department of Defense (DoD) consistently assert that, NCST provides the lowest cost for developing the highest quality space systems. Throughout his distinguished career, Mr. Wilhelm has been a positive force in shaping the direction and content of the nation's space technology program. His dedication to his work and his relentless quest for excellence have contributed immeasurably to the success of major national, DoD, and Navy space programs and deserves the highest recognition for his outstanding achievements.